

HOW TO 'SPEAK SCIENCE' AND BE UNDERSTOOD

Fundamentals

THE THREE GREATEST ENEMIES OF SCIENCE COMMUNICATION

The Curse of Knowledge

- You (the researcher) know 'too much'

LINGUISTICS AND STYLE

Ri

https://www.youtube.com/watch?v=OV5J6BfToSw&index=6&list=PLj0sL7Yn57fKWLcV7K7xhUzkG_4po7HUW

ELIMINATING THE CURSE OF KNOWLEDGE

Have “beginner mind”

- Remember what it was like
- Read w/in your field (& for your audience)
- Share a draft with a representative reader



Consider the desires & constraints of your reader

- They want to learn and understand – be educated, inspired, entertained.
- They want to feel smart
- They want to know what’s in it for them (Be safer, save money, protect loved ones, be happy)
- They want to do something with this information

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Defensive Communication

- You want to prove you know as much, or more, than your audience (or your source)

WHAT EVERYDAY ACT IS THIS DESCRIBING?

- To indicate is to create an index
- Index has spatial connection to indicatum
- Index is a perceivable action
- Indicatum is a conspicuous site

~~Needles Jargon~~

ELIMINATING DEFENSIVE COMMUNICATION

- Translate, don't "dumb down."
- Eliminate jargon when possible, define terms and use substitutions when not.
- Remember: Your peers (or your source!) already know this stuff! Stop trying to impress only them.
- Use substitutions, metaphors and analogies

“Over the past 13 years CPU performance has improved by a factor of 175, while IOPS (input/output operations per second) have only improved by a factor of 1.3 in HDDs.”

VS.

“In other words, while our computers’ brains have gotten faster and more powerful, they can’t perform at their maximum capacity because their internal storage devices are like old, rusty filing cabinets that are cumbersome to open and sort through.”

MORE ON METAPHORS

- Metaphors are abstractions; they needn't be precise.
- They let you think about things at a higher level without being bogged down by details.
- They make the unfamiliar familiar.
- Metaphors are a generous gift to your readers.

“Wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles... Radio operates exactly the same way... The only difference is that there is no cat.” – Albert Einstein (who is himself a metaphor for genius)

Your content
is dependent on
the context

LET'S PRACTICE!

CREATE A METAPHOR FOR:

- An animal cell
- Electricity
- DNA
- The human brain
- Wetlands
- The Large Hadron Collider
- Black holes
- Machine learning
- Communication networks
- Probiotics and prebiotics
- Evolution

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Lack of Emotional Contrast

- You fail to make us care about what you know.

SCICOMM: THE MISSING INGREDIENT

Broca's area

Broca's area is an important part of language formulation — even if someone has the motor ability to form the sounds necessary for words, Broca's area is necessary to form and express **language**.

Angular gyrus

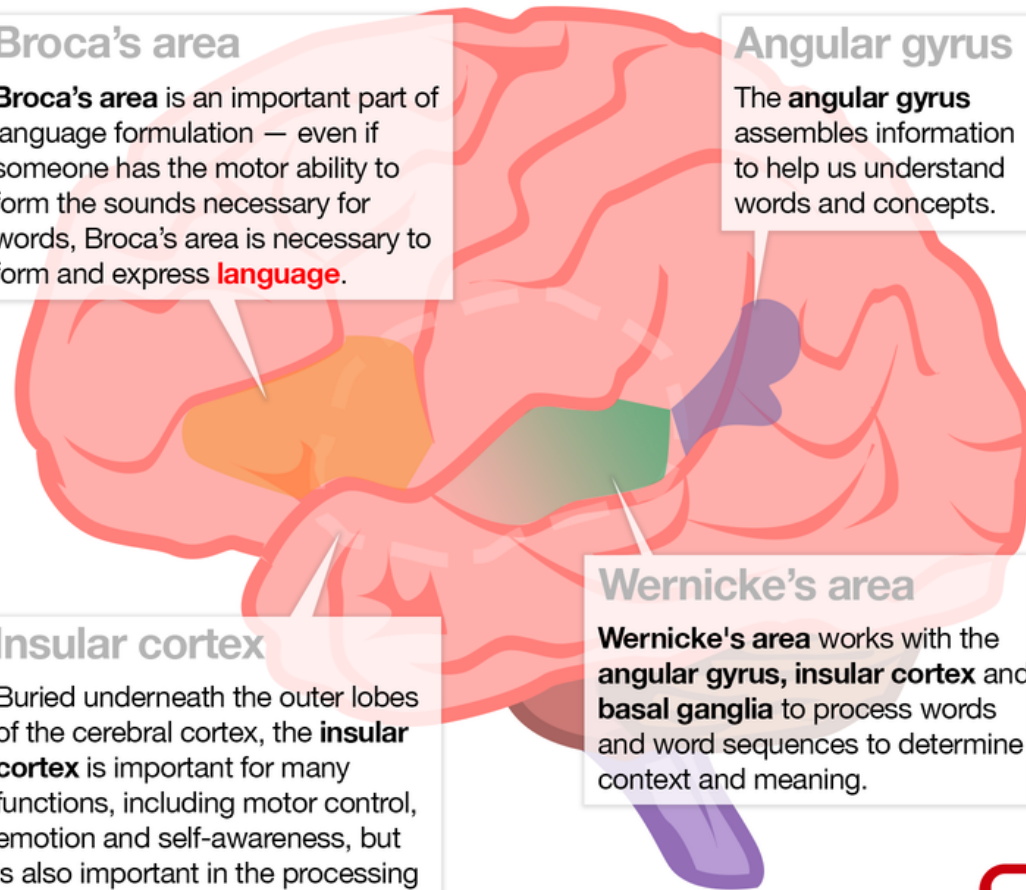
The **angular gyrus** assembles information to help us understand words and concepts.

Insular cortex

Buried underneath the outer lobes of the cerebral cortex, the **insular cortex** is important for many functions, including motor control, emotion and self-awareness, but is also important in the processing of language.

Wernicke's area

Wernicke's area works with the **angular gyrus**, **insular cortex** and **basal ganglia** to process words and word sequences to determine context and meaning.



PERSUASION

LOGOS

Consistency

Content
Arguments
Benefits
Facts
Figures
Data
Numbers
Statistics
Past Research
Processes
Specifications

ETHOS

Credibility/Trust

Content
Personal anecdotes
(why choose me?)
Testimonials
Citations
Titles

Delivery
Eye contact
Body language
Vocal Variety
Poise

PATHOS**

Emotions/Values

Content
Stories
Positive & negative
emotions (love,
anger, respect)

Delivery
Coherence (body
language and
voice 'match'
content')

** EMOTIONAL CONTRAST

ADDING EMOTIONAL CONTRAST

- Find the human element in every story
- Get emotion in there
- Use conversational language
- Use short anecdotes
- Use dialogue
- Use humor – but avoid making jokes



MORE ON EMOTIONAL CONTRAST

Emotions you might try to evoke:

- Fear (there is a problem!)
- Relief (there is a solution!)
- Trust (we can fix it!)
- Conviction (you can fix it!)
- Amazement (you won't believe this!)
- Curiosity (my work is interesting!)
- Inspiration (this work is revolutionary!)
- Totally pumped up (here's how you can help!)

TO DO SCIENCE

REQUIRES MORE

FACTS THAN FEELINGS

TO SHARE SCIENCE

REQUIRES MORE

FEELINGS THAN FACTS

LET'S PRACTICE!

IN-CLASS ASSIGNMENT

- Choose a topic you know well and any audience; shuffle audiences
- Choose a way to explain your selected topic to the audience you've been given
- Think of two ways you could address the curse of knowledge.
- Include at least one metaphor or analogy
- Find one way to add emotional contrast

Extra credit: Balance your explanation with elements of the three pillars of persuasive rhetoric throughout.